



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

11A

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,705	03/15/2004	Dongzhi Chi	4249-0113P	8968
2292 7590 04/06/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER TRAN, THANH Y	
			ART UNIT	PAPER NUMBER
			2822	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/06/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/06/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/799,705

Applicant(s)

CHI ET AL.

Examiner

Thanh Y. Tran

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/9/07.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) 12-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-11 and 22 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The amendment filed 1/9/07 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: providing a substrate comprising silicon and silicon oxide (claim 21).

As to claim 21, the new limitation, such as: “providing a substrate comprising silicon and silicon oxide”, introduces new matter into the disclosure of the invention.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 4-5, 8, 10-11 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Ku et al (U.S. 2004/0209432).

As to claim 1, Ku et al discloses a method of fabricating a nickel silicide layer, which comprises: providing a substrate comprising silicon (“silicon and/or polysilicon”) (see paragraph [0015]) which optionally comprises silicon oxide (“desired silicide”) (see paragraph [0015]); depositing a layer of at least a 3-component metal alloy comprising nickel on a surface of the

Art Unit: 2822

substrate ("nickel/tantalum alloys") (see paragraph [0010]); and annealing the alloy and the substrate to form the nickel silicide layer ("nickel silicide") (see paragraphs [0010, and [0012]]).

As to claims 2 and 22, Ku et al discloses a method of fabricating a nickel silicide layer, wherein the alloy further comprises: a) at least one metal selected from the group consisting of titanium, zirconium and hafnium (see paragraph [0016]); and b) at least one metal selected from the group consisting of platinum and palladium (see paragraph [0016]).

As to claim 4, Ku et al discloses a method of fabricating a nickel silicide layer, wherein there is no substantial film agglomeration and NiS.sub.2 formation (see paragraph [0009]).

As to claim 5, Ku et al discloses a method of fabricating a nickel silicide layer, wherein the substrate comprising silicon includes gate, source and drain regions and contact regions (see paragraphs [0036]-[0037]).

As to claim 8, Ku et al discloses a method of fabricating a nickel silicide layer, wherein any excess metal alloy, which has not reacted with at least one surface of the substrate, is removed from the semiconductor structure ("remainder" which is not reacted is removed, see paragraph [0008]).

As to claim 10, Ku et al discloses a method of fabricating a nickel silicide layer, wherein the annealing is performed in a vacuum, in nitrogen gas ("N.sub.2 gas") or in another inert gas ("inert gases") (see paragraph [0042]).

As to claim 11, Ku et al discloses a method of fabricating a nickel silicide layer, wherein the substrate is selected from Si_{1-x}Ge_x, wherein $x < 1$ (see paragraph [0015], when $x=0$, Si_{1-x}Ge_x = Si, and paragraph [0015] discloses that the substrate comprising of Si).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ku et al (U.S. 2004/0209432).

As to claims 6 and 7, Ku et al does not disclose the 3-component metal alloy is sputter deposited to a thickness of up to 500 Angstroms; and wherein the annealing is performed at a temperature of up to 800.degree. C. However, providing a thickness of up to 500 Angstroms for a metal alloy, and a temperature of up to 800.degree. C for annealing a alloy metal would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. See In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ku et al (U.S. 2004/0209432) in view of Shah et al (U.S. 6,509,094).

Art Unit: 2822

Ku et al does not disclose the alloy consists of $\text{Ni}_{1-x-y}\text{Ti}_x\text{Pt}_y$, wherein $0.25 \geq x \geq 0.02$ and $0.25 \geq y \geq 0.02$.

Chi et al discloses in claims 7 and 9 an alloy consists of $\text{Ni}_{1-x-y}\text{Ti}_x\text{Pt}_y$, (“NiTiPt”) material (when $x = 1$, $y = 1$, $\text{Ni}_{1-x-y}\text{Ti}_x\text{Pt}_y = \text{NiTiPt}$). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the method of Ku et al by using an alloy consists of NiTiPt material as taught by Shah et al for improving the thermal stability.

Allowable Subject Matter

7. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8 Applicant's arguments filed 1/9/07 have been fully considered but they are not persuasive.

Applicant argues that Ku et al. fail to teach or fairly suggest the instant process for forming a nickel silicide product having thermal stability and sensitivity to interfacial oxide as presently claimed.

Applicant's argument has been fully considered but it is not persuasive because it is noted that the features upon which applicant relies (i.e., forming a nickel silicide product having thermal stability and sensitivity to interfacial oxide) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification

Art Unit: 2822

are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argues that Ku et al. implicitly teach away from using platinum and/or palladium as is required by instant claim 2.

Ku et al clearly discloses a method of fabricating a nickel silicide layer, wherein the alloy further comprises: a) at least one metal selected from the group consisting of titanium, zirconium and hafnium (see paragraph [0016]); and b) at least one metal selected from the group consisting of platinum and palladium (see paragraph [0016]).

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Y. Tran whose telephone number is (571) 272-2110. The examiner can normally be reached on M-F (9-6:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith, can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TYT



Mary Wilczewski
Primary Examiner